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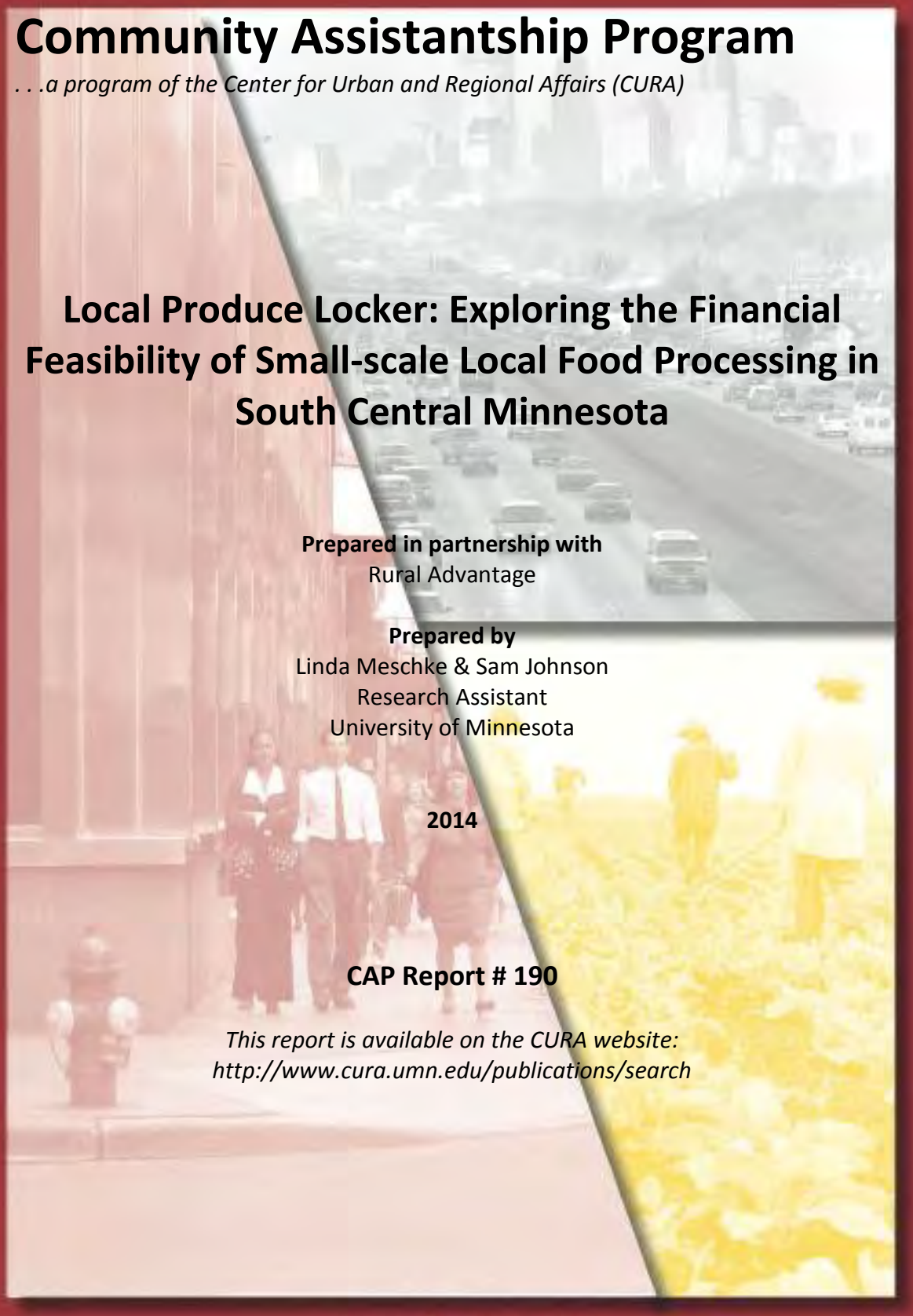

Local Produce Locker: Exploring the Financial Feasibility of Small-scale Local Food Processing in South Central Minnesota

Prepared in partnership with
Rural Advantage

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RURAL ADVANTAGE

Local Produce Locker

Exploring the Financial Feasibility of Small-scale Local Food Processing in South Central Minnesota

Linda Meschke & Sam Johnson

5/25/2014

Thanks to CURA and Rural Advantage for their support and guidance.

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Executive Summary

We will explore the Financial Feasibility of a produce locker to gain information that will inform an overall feasibility study for small-scale food processing of local produce.

Background: The market for locally grown produce is increasing both nationally and in South Central Minnesota. The growth of the market has been strong, but tempered by a lack of supporting infrastructure such as aggregation, transportation, and processing/manufacturing at a scale small enough to be accessible to local producers. While aggregation and transport can be coordinated by local producers without significant additions of equipment or time (exemplified by the success of local farmer's markets), processing/manufacturing opportunities are unavailable to local growers due to consolidation within the food processing industries, economies of scale, and government regulations. Currently, this produces a barrier for small-scale farmers to reach markets to sell their product, specifically when current demand within the growing season from larger institutional partners and other potential customers is contingent on the availability of produce outside the growing season.

Successfully developing a produce locker would overcome this barrier as local small-scale producers would be able to dedicate a portion of their harvest to third-party processing which would result in: scaling up local food offerings; extending the season of locally grown produce; creating a more stable supply of local foods for institutions looking to purchase local produce in the winter; and creating alternative markets for local farmers to sell their product.

Objective: The goal of this report is to provide the beginning framework for the financial feasibility of a produce locker that can help determine the scale of operation for which a food processing business can be successful. Our hope is this beginning framework can inform future feasibility studies on business development of local food systems.

Methodology: The report relies on previous complete feasibility studies on local food processing systems by Colorado State University Extensions (Hine, S. & Umberger, W. 2002) and the University of Wisconsin Madison (Boyd, D. 2004), and other reports on food processing systems. It also relies heavily on the example and input given by The Western Massachusetts Food Processing Center (FPC) and local food processing industry experts. Both helped clarify the basic needs and reasonable inputs necessary to beginning a food processing venture.

Results: Our model calculated freezing 5 vegetables with capacity spanning 10,000 to 50,000 pounds of total produce. We found that at such small levels of input, Revenue does not cover costs and the business model is not financially feasible. This is consistent with other feasibility studies for small-scale food processing plants. They concluded that the cost of equipment and labor, on top of competing with conventional retail food prices would leave any new processing venture unable to make a profit. However, it does appear that at retail prices, the breakeven point is achievable and could occur by adding another +100,000 lbs. of overall produce to processing capacity.

Next Steps: We hope that this study can help inform a more robust feasibility study on food processing in Minnesota which identifies more precisely the scale and scope necessary to build infrastructure around successful small-scale food processing. Other possibilities for further research would be other varieties of processed vegetables or expanding beyond freezing into canning, fresh-cut vegetables, dehydrating or other food-processing option.s In the end, we hope our findings can help guide local entrepreneurs to creating the first small-scale food processing center in Minnesota.

Introduction

Rural Advantage, with support from CURA (the Center for Urban and Regional Affairs), has researched preliminary findings to support an overall feasibility study for a business venture we are calling a 'Produce Locker'. A Produce Locker will be a business that processes and stores local foods during the season to be sold at local institutions such as retirement homes, schools, and assisted living centers out of season. The Produce Locker would provide a licensed commercial kitchen for processing produce grown in gardens and fields within 60-miles of the building, to be located in Martin County. The business is intended to develop local food industry through extending product availability into the winter and early spring through processing methods such as freezing, chopping, canning, juicing, or drying. This report will focus on freezing five vegetables produced locally as a way to provide insight for the necessary considerations for a functional produce locker. The five vegetables were chosen because their peak harvests spread over the entire season allowing their processing to spread over a six month period. Other considerations such as potential value added and market demand could be considered as well in further studies.

We are working on a produce-locker feasibility study. The concept of the study is that with the growing demand of local produce, we can demonstrate the market assurance necessary for new operations that help local growers scale up production and expand the length of their growing season through processing foods. Though current food-systems only support the processing of foods at a much larger scale than is possible for most local producers, the current enthusiasm behind local foods coupled with government support for local food infrastructure may signal new opportunity for small producers and agricultural entrepreneurs.

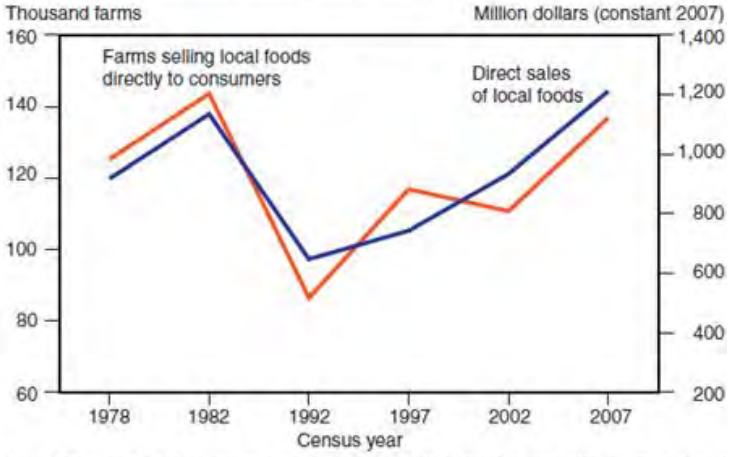
Current Climate for Local Foods

> *"The local food supply chain lacks mid-scale, aggregation and distribution systems that move local food into mainstream markets in a cost-effective manner. Lack of investment capital for supply chain infrastructure, such as vehicles, temperature controlled storage facilities, and processing plants, can be a significant barrier to starting local aggregation and distribution businesses. Farmers have stated that regulatory and processing barriers to meat and value-added product sales present significant obstacles to increasing local sales. Small-scale meat processing facilities often lack capacity, equipment, acceptable inspection status, and human/financial capital to meet demand requirements. In addition, both growers and buyers express a need for more midscale food processing to improve efficiencies in institutional food preparation." (Newman, C. 2010)*

Increasing Demand for Local Foods

Local food options and the infrastructure surrounding them have been exploding in size and popularity over the past 20 years (figure 1). While still comprising a very small share of the food economy and severely restricted by a lack of infrastructure like processing plants, storage facilities, and transportation; farmers markets, CSA's and other new initiatives are making it possible for citizens to access food grown in surrounding rural areas. The food is being touted as good for local economies, fresher, healthier, enriching the community and

Figure 1
Direct-sales farms and direct sales of local foods, 1978-2007



Note: Inflation adjusted sales were calculated based on the gross domestic product implicit price deflator published by the Bureau of Economic Analysis, U.S. Department of Commerce and calibrated to 2007=100.
Source: 1978, 1982, 1992, 1997, 2002, and 2007 U.S. Censuses of Agriculture.

protecting the environment Low, Sarah A., Vogel, Stephen (2011).

The popularity of Local food in the Fairmont area mirrors national trends in which local food business models such as CSAs, farmers markets, and coop grocers, though quite small and limited in scope, are growing rapidly. Local food options have thrived primarily in Direct-Sales Markets. Farmer's Markets, Farm Stands, CSAs, and programs such as Farm-to-school are providing opportunity for farmers to capture a larger share of the end consumer's food dollar. As a result, small and mid-sized farms (less than $250,000 in sales) have been able to produce 57 percent of all U.S. direct sales (NRC 2010). People have been turning to direct-sales options because of the perception that food transported from distant sources contributes more pollution and tastes less fresh. They also want to support local business and develop more connections with the people growing their food. As a result, farm production for direct-sale has increased 3-fold between 1992 and 2008. Farmers' markets across the nation have quadrupled between 1980 and 2007 to 4,385 and generated over $1 billion in 2005. CSAs have increased from two in 1986 to over 12,000 in 2009 (NRC 2010).

Local food systems have been shown to be better for local economies due to positive net economic impacts and multiplier effects of keeping capital in the local economy. For example, an examination of the net economic impact of farmers markets in West Virginia offset by the loss in grocery store sales found that farmers markets still caused a positive net impact of $1.075 million (Brown, C., & Miller, S. 2008). Capital stays local through substituting national or international food products with local production, processing, transport, and markets. Farmers markets in Iowa were found to have multiplier effects of 1.58 on indirect and induced sales for the producer and an additional effect of 1.47 due to indirect and induced income in the surrounding area (Newman, C. 2010).

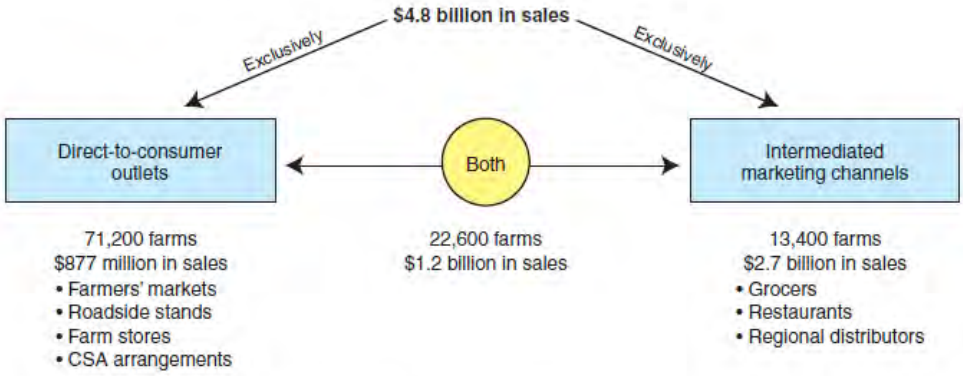
Local Growers Reaching Capacity

Though local food systems have a strong positive effect on the economy, current systems have serious limitations. Business structures such as farmers markets and CSAs do not provide sufficient income for participating farmers and meeting demand through partnerships such as farm-to-school programs remains underdeveloped due to the current inability of local farmers to provide food outside the growing season. While farmers market are beneficial to local economies and increase the percentage of the final dollar that farmers receive for their produce, the short growing season in Minnesota prevents most participating farmers from receiving sufficient income because the volume they are able to grow and sell is limited. Nationally, the average income for farmers from farmers markets was less than $5,000, signaling that most farmers participating had other supplemental household income (Brown, C. 2008). CSA's also had mixed beneficial economic outcomes for farmers. Though CSAs generally gave better returns than conventional whole-sale options, many were not able to cover the costs of production (Brown, C. 2008).

Lack of Availability to Schools, Institutions

In order to increase scale and profitability, local food advocates are fostering partnerships with markets through institutions such as Farm-to-school programs. Though they offer a significant potential, barriers remain. Schools currently have access to local foods through conventional distributors. The distributors generally have relationships with only one large primary supplier and a backup. As a result, small local farms (gross farm sales less than $50,000) amount to 81% of farms growing local foods, but only account for 11% of total local food sales (Low 2011). 72% of them make their sales through direct to consumer methods such as farmers markets or road side stands.

Figure 2
Farmers' local food marketing, 2008



CSA=Community-supported agriculture.
Source: USDA, Economic Research Service calculations based on 2008 Agricultural Resource Management Survey, conducted by USDA, National Agricultural Statistics Service and Economic Research Service.

Small-scale growers are excluded from partnering with larger institution and from accessing larger processing systems because of several issues (Newman, C. 2010):

1) *Capacity limitations for small-scale farmers who have difficulty achieving high volumes, consistent quality, timely deliveries, and out-of-season availability demanded by the established food industry.*
2) *A lack of local food supply chains capable of transporting, processing, and storing local food.*
3) *An inability of larger retailers to rely on small producers with no alternative should their products fail*
4) *A lack of consumer knowledge about the seasonality of products*
5) *A reticence from food service directors to engage in time consuming tasks such as negotiating terms of service and coordinate deliveries*
6) *Having the resources to engage with health officials and other regulatory requirements necessary to gain certification*

Studies done over the past 15 years have consistently shown that such a service would likely not be financially feasible. Reports from Colorado State University Extensions (Hine, S. & Umberger, W. 2002), the University of Wisconsin Madison (Boyd, D. 2004), and the Institute for Agriculture and Trade Policy (Berkenkamp, J., Mader, L., & Kastler, M. 2012) all came to the conclusion that small-scale food processing was not feasible due to barriers such as the high cost of labor and equipment, unwieldy government regulations and superior pricing of more established food sources. On the other hand more recent emergence of local food processing operations that project profitability in upcoming years coupled with stronger governmental support for developing local food system infrastructure suggests the time may be soon that small-scale local food processing becomes feasible.

Concept of a produce locker

A produce locker for small-scale local farmers could engage many of the above constraints in South-central Minnesota by providing a central business better able to meet the scale and consistency needs of potential institutional partners. As described by Rural Advantage (Meschke, L. 2014):

> *The produce locker is a business concept similar to a meat locker, but processing produce instead of meat. The goal of the business is to encourage the development of local food production and sales through a service to growers and a resource for cafeterias and restaurants…. Many businesses want to serve local food, but are unable to justify the increased cost of labor and equipment to take whole foods to usable forms. The locker will have contacts with local growers interested in selling their produce. With several growers, it will be easier to*

meet the quantities required by cafeterias and restaurants. In addition, home gardeners will have a place to take their bounty for processing so their months of hard work don't go to waste.

The produce locker will receive, process, and store local produce from area farmers and gardeners during the growing season, and then sell to interested parties after local produce becomes unavailable in the fall. Vegetable processing requires basic actions at all levels of production. Common steps for freezing produce include (Berkenkamp et al. 2012):

1. Inspect the produce upon receipt from the supplier.
2. Set up and sanitize the processing station.
3. Wash and trim the product.
4. Peel/chop/grate the product into the desired form
5. Blanch the product by briefly immersing it in boiling water.
6. "Shock" the blanched product in an ice water bath to lower its temperature.
7. Drain off excess water.
8. Place on trays or in shallow pans and place in a holding freezer until thoroughly frozen
9. Place frozen product in appropriately sized containers given intended uses.
10. Move the product to freezer for storage.
11. Clean up and sanitize work area.

Though the process is the same regardless of scale, it can be difficult to gauge necessary inputs such as staff size, labor hours, and equipment needs. For example, a major tenet of small-scale processing would be providing steady employment for all involved. Any successful business would need to provide its employees steady work throughout the growing season. The Western Massachusetts Food Processing Center (FPC), provides insight on frozen food processing at very small scales with their 2010 pilot study (Christie, M. 2010)

FPC process

Three staff begin by sanitizing and prepping the kitchen. Two staff then unpack and wash the produce in 5 gallon sinks while two staff trim the washed broccoli with knives. Another staff-person uses the RoboCoupe CL55 Processor (4 quarts capacity) to chop the broccoli, and the final staff-person then blanches the broccoli in perforated pans in the Market Forge tilt skillet (25 gallon capacity). Two staff cycle back around and quickly shock the blanched broccoli in a cold water bath (50 gallon basins) to stop cooking, and then drain the broccoli in perforated pans and colanders. Two staff then bag the broccoli in 5 pound plastic bags, weigh the bags on a digital scale, vacuum seal the bag, and load 4 bags into a 20 pound box. Staff members then load the boxes into the freezer, and leave the product for 24-48 hours to freeze. Staff clean and sanitize the kitchen. This option takes 12.25 hours to process 2,000 pounds of chopped broccoli, and another 24 to 48 hours to freeze. Including the FPC Manager, Option A requires 66.75 staff hours (6 staff total).)Christie, Margaret 2010)

Their pilot study becomes our model for what constitutes a most basic food processing system.

Methodology

The report focuses on the financial feasibility of the project after one season of operation. The financial feasibility is articulated through estimating fixed and variable costs common to food processing operations modelled on the FPC pilot study and adjusted to reflect local conditions. Costs covered via business loan will be considered according to repayment with interest over a 15 year period. These costs are subtracted from revenue estimates for five vegetables: asparagus, broccoli, carrots, green beans, and winter squash.

For fixed costs, we include the cost of the facility, equipment, government licensing, and loan payments (appendix 1). Estimating the cost of the facility is done using local experts in the Fairmont area. Equipment costs are gleaned from interviews with local industry reps and academic reports articulating basic equipment needs. Licensing costs and loan interest estimates are taken from online government resources. The total amount of the loan is considered as half of total fixed cost because of the availability of government grants for small businesses that support local food systems infrastructure.

The variable costs we include are the cost of local produce, labor, packaging, and the utilities - water and electricity (appendix 2). The cost of produce is estimated using pricing information from the Minnesota Valley Action Council Food Hub. The cost of labor is estimated using salary averages for SW Minnesota from the Bureau of Labor Statistics in the US Department of Labor. They are multiplied by an estimate of hours worked given in the FPC model above. Managing hours are estimated at quarter time for 6 months when considering harvest levels of 2000 and 5000 pounds of each vegetable and is estimated at half-time for 6 months when considering 10000 pounds of each vegetable. Packaging is estimated using statistics from the IATP's "Frozen Local" report (Berkenkamp 2012). Water and electricity estimates are created using Fairmont area utility pricing against equipment consumption estimates from specification sheets provided by industry representatives.

Two revenue estimates are created to show high and low parameters for possible prices (appendix 3). The high estimates are created through averaging current conventional local retail prices for the five frozen vegetables from Fairmont area grocers. The low prices are created by multiplying those estimates by a ratio of manufacturing prices to retail prices provided by the USDA's Economic Research Services.

We chose crops due to their availability from local producers in the Fairmont area and complementary harvesting times in relation to each other over the growing season. Asparagus is harvested early, followed by green beans, carrots, broccoli, and finally winter squash. With the produce ripening in waves, the business can process each as it peak without being overwhelmed by ripe produce.

Two significant categories absent in the estimation of costs are those of insurance and taxation. Both are necessary costs but contingent on a specific business structure (non-profit vs LLC vs cooperative) and market (public consumption vs contracting with local schools or assisted living centers) and are beyond the scope of this report. Other likely costs that are left out of this report due to their variability, but should be noted are product transportation, marketing costs, and employee training.

Findings

Consistent with previous research, processing produce with our model at such small levels of input is not financially feasible. Revenue does not cover costs at either manufacturing or retail price (Appendix 4). However, it does appear that at retail prices, the breakeven point is achievable and could occur by adding another +100,000 lbs. of overall produce to processing capacity. This is consistent with FPC's current profitability outlook for their freezing operation.[1]

Costs

Both fixed and variable costs are underreported in our model, though there is room to cut costs for each estimate with alternative models. In considering fixed and variable costs, unreported necessary costs mentioned above (insurance, taxes, etc) mean that the possibility of breaking even is further away than our

[1] In a recent phone conversation with the FPC, they informed us that expansion of freezer storage in addition to the purchase of a IQF tunnel has led them to project a profit by freezing over 250,000 pounds of produce next year.

estimates suggest. Even more, costs within our estimates are variable and likely to increase as is common for all new ventures. For example, the cost of a new facility does not include any potential construction necessary to bring the facility up to code. Initial labor may exceed our estimates as employees take longer in the beginning to become familiar with the processing system laid out by FPC above.

Conversely, there are many places entrepreneurs could easily cut costs. For example, though we estimate the cost of buying a facility and new equipment, the existence of food processing infrastructure in the Fairmont region suggests there is a possibility to rent facilities or used equipment. This would save a significant amount due to the fact that our model only estimates processing for six months. A new venture could save by only investing in storage space year round and pay for processing facilities as needed. In order to better understand where cost overruns or saving are possible, each input is examined more closely in sections below.

Fixed Costs

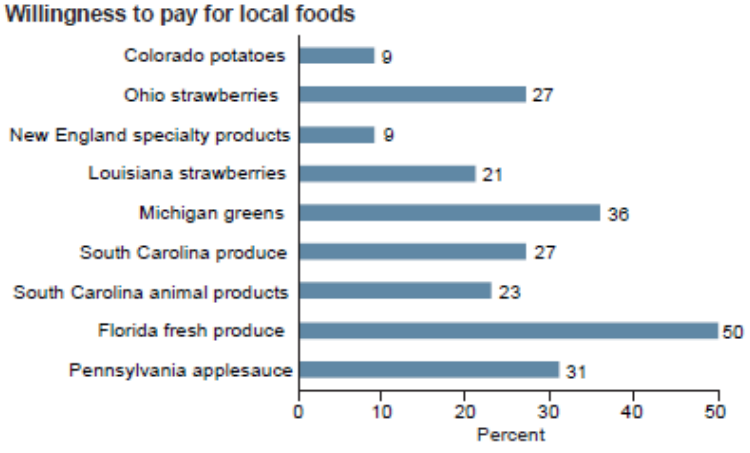
When considering fixed costs, other savings are possible in addition to renting facilities and equipment. While total equipment costs $91,980, the largest price point is the construction of new coolers and freezers (appendix 1). Many of the facilities for sale in the Fairmont area are restaurant spaces with freezer and cooler space included (Meschke, L.). Another significant contributor to overall fixed costs is loan interest. Loan amounts and interest rates necessary for startup costs vary significantly depending on local lenders willingness to borrow and access to government funding. Even as a private business, entrepreneurs have access to guaranteed loans and low interest rates through the USDA by virtue of supporting local food infrastructure. Depending on the business model of the venture, significant grants are available for up to $500,000 at the federal level (7 U.S. Code § 1632a - Value-added agricultural product market development grants) and up to $150,000 in the state of Minnesota (2014 Minnesota Value Added Grant Program). Since the conditions for most government grants specified that they would cover up to half of overall costs for private ventures, we use a business loan for half price for our final estimate. Regardless of the total loan, at the sizes we are considering, the USDA will help lower the final interest rate by guaranteeing the loan amount, essentially acting as co-signer (Know your Farmer, Know your Food 2010).

Variable Costs

The price of produce, labor, packaging, and utilities can vary wildly. Our model considered the most up-to-date information from local sources, but those estimates quickly become dated. Food prices fluctuate wildly over the farm season due to innumerable factors. Labor costs will increase with inflation and upcoming increases in the minimum wage. Utility estimates will compound as equipment and operations expand. In terms of produce, while our estimates are generally accepted norms; flood, drought, infestation and many other factors could cause them to change. One way to lower food costs is purchasing seconds from local farmers for processing; i.e. food that has imperfections and would not be sold at markets (Berkenkamp et Al. 2012).

Revenue

Just as the cost of produce can vary wildly, the price received for local produce changes also. To gain perspective on the range of pricing options available to small-scale food processing entrepreneurs, we calculated the price as retail pricing (appendix 3). Retail prices are given as reference for



those looking to sell directly to consumers. The price is likely low due to evidence suggesting people are willing to pay anywhere from 9 to 50 percent more for local produce (see figure 3). This increase does not translate to prices negotiated with potential institutional partners (Newman 2010). They will expect to pay close to the same price. However, ventures looking to sell at retail price directly to consumers can expect to charge above retail price.

Conclusion

Demand for local food has increased dramatically over the past 20 years causing proponents to search for ways to help local food markets continue to increase in size and scope. Producers in Minnesota are reaching capacity as the short growing season coupled with barriers to conventional food systems leave them unable to reach larger and more lucrative markets and institutions. A produce locker can act as a bridge between producers and larger markets by processing and storing local food to be sold after the growing season and thereby expand the availability of local foods. Thus far, feasibility studies for small-scale food processing plants conclude that the cost of equipment and labor, on top of competing with conventional prices would leave any new processing venture unable to make a profit. However, with the increase in government grants dedicated to fostering local food-systems and pilot models such as the FPC showing it may be possible to break even, the day for local food processing may be just around the corner.

Even in lieu of robust profitability, expanding local food systems has not only been shown to be a powerful engines for local economies, but good for the community. In examining the current state of Minnesota's local food systems, the Cooperative Development Services found that those currently working in the field were there because they were able to "successfully build a sense of community and camaraderie among the producers as well as inciting a strong sense of purpose." (CDC 2009). In this spirit we hope that others will use this report to continue building local food systems for the benefit of the Fairmont community or wherever they may be.

Appendix 1: Fixed Costs

FIXED AND STARTUP COSTS

Facility

Options	Cost		
Stand-alone Purchase	**$94,000**	Quote from Rural Advantage	
TOTAL FACILITY COST	**$94,000**		

Equipment

Type	Cost		
Pallet-Jack	$300	Global Industrial	
Floor-Scale	1,500	Uline Online	
Cooler x 10' x 12'	$8,609	Conversation with rep from	Total Refrigeration
Delivery and Setup	500	Conversation with Dave of Benck Mechanical	Benck Mechanical
storage totes x 20	400	WEBstaraunt Online	
Carts x 3	$201	WEBstaraunt Online	
sinks x3 (food, processing, ware)	$1,200	One x 3 Compartment Sink WEBstaraunt Online	2 x 1 compartment Sink
Faucets x 3	$600	WEBstaraunt Online	
Stainless steel tables 4 36"x10'	$3,200	conversation with Dan Deroma	Daly and Deroma Group Inc
Counter Scale	$229	WEBstaurant Online	
Kitchen wares			
Produce knives x 10	$78	WEBstaraunt Online	
Chef's Knife set	$193	WEBstaurant Online	
Cutting Boards x 10	$150	WEBstaraunt Online	
Other Misc.	$500		
Trash Cans with wheels x 4	$200	WEBstaraunt Online	
Kettle Blancher (w/ paddle and steam jacket cool down system) 50 gallon	21,000	conversation with Dan Deroma	Daly and Deroma Group Inc
Blast cooler/Freezer (24 lbs of product) x	$15,000	conversation with Dan Deroma	Daly and Deroma Group Inc
Vaccuum Packer x 2 (	$3,400	Webstaraunt Online	
shelves or speedracks	1,200	WEBstaraunt Online	
Freezer x 1,000 square feet	33,520	Conversation with rep from Total Refrigeration	Total Refrigeration
TOTAL EQUIPMENT	**$91,980**		

Government Licensing

USDA Food Processing Licence	$112.00	Licensing at MN.gov
State Licensing		
Wholesale Food Processing Licence	$169	Licensing at MN.gov
Local Licensing		
TOTAL LICENSING	**$281**	

Loans (15 years at 3.9% interest)

Options	Total	Monthly Payments	Total Annual cost	(total annual interest)	*(interest accrued over 15 years)*
Loan for all facilities and equipment	$186,261	1,368.43	16421.16	$4,003.80	*60,057.26*
Loan for half	**$93,130.50**	**684.22**	**8210.64**	**2001.96**	***30,381.54***

TOTAL FIXED COSTS

Total over life of loan (15 years)	$123,512
Annually	**8210.64**

Appendix 2: Variable Costs

COST FOR PRODUCE

Vegetable	Year	Farm Price*	Total Cost at X pounds of produce per input:		
	2014 Estimates	per pound	2000	5000	10000
Asparagus	"	$3.52	$7,040.00	$17,600.00	$35,200.00
Broccoli	"	0.66	$1,320.00	$3,300.00	$6,600.00
Carrots	"	$0.27	$540.00	$1,350.00	$2,700.00
Green Beans	"	$1.76	$3,520.00	$8,800.00	$17,600.00
winter squash	"	$0.45	$900.00	$2,250.00	$4,500.00
		Total Cost of Produce	**$13,320.00**	**$33,300.00**	**$66,600.00**

*Minnesota Valey Action Council Food Hub

COST OF LABOR

Position	Wage (includes Payroll tax)	Estimated Time (hrs) to Process X amount (lbs) of total produce (assuming 6 can process 2000 lbs in 12.5 hours)*					
		10000	Administration[3]	25000	Administration[4]	50000	Administration[5]
Manager[1]	$23.12	62.5	240	156.25	240	312.5	480
Temp 1[2]	$11.27	62.5	0	156.25	0	312.5	0
Temp 2[2]	$11.27	62.5	0	156.25	0	312.5	0
Totals		**187.5**	**240**	**468.75**	**240**	**937.5**	**480**

1 - SW MN Food Service Manager Median Wage
2 - SW Minnnesota Food Production Median wage

3- Working quarter time for 6 months

4 - Working quarter time for 6 months

5 - working half time for 6 months

	Total Salary for Production (wage multiplied by estimated time)					
	10000	Admin.	25000	Admin	50000	Admin
Manager[1]	$1,445.00	$5,548.80	$3,612.50	$5,548.80	$7,225.00	$11,097.60
Temp 1[2]	$704.38	$0.00	$1,760.94	$0.00	$3,521.88	$0.00
Temp 2[2]	$704.38	$0.00	$1,760.94	$0.00	$3,521.88	$0.00
	$2,853.75	**$5,548.80**	**$7,134.38**	**$5,548.80**	**$14,268.75**	**$11,097.60**
TOTAL SALARY	**$8,402.55**		**$12,683.18**		**$25,366.35**	

PACKAGING

Packaging (per lb)	pounds	TOTAL
$0.05	9220	**$461.00**
$0.05	23050	**$1,152.50**
$0.05	46100	**$2,305.00**

(based on estimates from "Freezing Report")

UTILITIES

Water/wastewater

Produce Level	Gallons used	Water Rate per 100 ft^3	Water Fee	Wastewater Rate per 100 ft^3	Wastewater Fee	TOTAL WATER
10000 lbs of produce	50,000	$3.94	$263.37	$3.18	$212.57	**$475.94**
25,000 lbs of produce	125,000	$3.94	$658.42	$3.18	$531.42	**$1,189.84**
50,000 lbs of produce	250,000	$3.94	$1,316.85	$3.18	$1,062.83	**$2,379.68**

Fairmont, MN Water Rates

Electricity (KW hours annually)

Produce Level	Cooler running for five months*	Freezer running for nine months*	Flash Cooler/Freezer Processing x pounds	Kettle Processing x pounds	Total Kilowatts Per Hour	Fairmont Electric Rate	TOTAL ELECTRICITY
10000 lbs of produce	7050	36,603	7500	3000	54153	$0.08	**$4,115.63**
25,000 lbs of produce	7050	36,603	18750	7500	69903	$0.08	**$5,312.63**
50,000 lbs of produce	7050	36,603	37500	15000	96153	$0.08	**$7,307.63**

* estimated using U.S. Cooler Estimates

Estimated using Nor-Lake NBCF44/24-4 model

MODEL DEF/4 Domestic STEAM JACKETED KETTLE 60 gallon

Fairmont, MN Electric Rates

TOTAL VARIABLE COSTS

TOTAL VARIABLE COSTS

Appendix 3: Revenue

Initial Pounds	Produce	Labor	Materials	Utilities	Total Variable Cost
10000	$13,320.00	$8,402.55	$461.00	$4,591.57	**$26,775.12**
25000	$33,300.00	$12,683.18	$1,152.50	$6,502.47	**$53,638.14**
50000	$66,600.00	$25,366.35	$2,305.00	$9,687.31	**$103,958.66**

Local Frozen Food Prices (May 23rd 2014)

Fareway	Walmart	Hyvee	Average
Asparagus –4.78 / lb.	5.96 / lb.	4.52 / lb.	**5.08 / lb.**
Broccoli (cut) – 1.29 / lb.	0.98 / lb.	(chopped) –1.29 / lb.	**1.19 / lb.**
Carrots – 1.29 / lb.	1.17 / lb.	1.39 / lb.	**1.28 / lb.**
Green beans - 1.93 / lb.	0.98 / lb.	2.07 / lb.	**1.66 / lb.**
Winter squash - 2.38 /lb.	na	2.65 / lb.	**2.515 / lb.**

Revenue

Product	Form	Average Retail Price[1]	Revenue at Retail Price					
	Frozen	Per Pound	Total lbs after processing 2000 at 6% shrinkage*	Revenue	Total lbs after processing 5000 at 6% Shrinkage*	Revenue	Total lbs after processing 10000 at 6% shrinkage*	Revenue
Asparagus	Whole/spears	$5.08	1880	$9,550.40	4700	$23,876.00	9400	$47,752.00
Broccoli	Frozen1	1.19	1880	$2,237.20	4700	$5,593.00	9400	$11,186.00
Carrots	Frozen2	$1.28	1880	$2,406.40	4700	$6,016.00	9400	$12,032.00
Green Beans	Whole3	$1.66	1880	$3,120.80	4700	$7,802.00	9400	$15,604.00
winter squash	Frozen4	$2.51	1700	$4,267.00	4250	$10,667.50	8500	$21,335.00
		TOTAL	9220	**$21,581.80**	23050	**$53,954.50**	46100	**$107,909.00**

*Buzby, J. C. et al (2014) Also, winter squash estimates at 15% from 'Loss to cooking' average.

1- Survey and average of 3 primary Fairmont Grocers - HyVee, Walmart, Fairway 5/21/14

Appendix 4: Gross Profit

Revenue - (Total Fixed Costs + Total Variable) = Gross Profit

Yearly Revenue		*minus*	Fixed Annual Costs	*and*	Marginal costs	*equals*	Profit Margin
Total Pounds	**Retail Price**						
9220	$21,581.80	-	$8,211	+	$26,775.12	=	**($13,403.96)**
23050	$53,954.50	-	$8,211	+	$53,638.14	=	**($7,894.28)**
46100	$107,909.00	-	$8,211	+	$103,958.66	=	**($4,260.30)**

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